

September 25, 2018

Subject: Climate Change Research Program – California Climate Change Technology and Solutions Initiative

Reporting Period: August – September 2018

Staff Lead: Douglas Burt

Recommended Actions

1. Approve and adopt amendments to the Climate Change Research Program's Research Investment Plan and approve its use to guide future research investments.
2. Approve framework for Round 2 of the Climate Change Research Program and direct staff to develop a Request for Proposals.

Summary

This report outlines updates to the program's Research Investment Plan. The plan was developed in response to the legislative requirements for the Climate Change Research Program, which is administered by the Strategic Growth Council (SGC) and funded with money appropriated from the Greenhouse Gas Reduction Fund. The report also summarizes a recommended framework for awarding funds appropriated to the Program in the 2018-19 budget.

Background

In 2017, the Legislature passed Assembly Bill (AB) 1091, which created a climate change research program within the SGC. Statute directed SGC to develop a Research Investment Plan to outlines research needs; award grants on a competitive basis; and to have the program open to eligible institutions, including the University of California, California State University, federally-funded national laboratories, and private, non-profit colleges and universities. The Council approved the Research Investment Plan in January 2018 and awarded the first round of awards in July 2018.

The Legislature passed Assembly Bill (AB) 856¹ in 2018, appropriating \$18 million for a Round 2 of the Climate Change Research Program within the SGC. This legislation allocates Greenhouse Gas Reduction Fund revenues to support "research on reducing carbon emissions, including clean energy, adaptation, and resiliency, with an emphasis on California." In the Governor's January budget, he proposed that the funding be used for the California Climate Change Technology and Solutions Initiative. The Initiative will help bridge the gap to new technologies, modeling, and analysis, leading to greater GHG emission reductions and resilience statewide. Round 2 will use the same Research Investment Plan that was adopted in 2017-18 to guide investments.

¹ http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201720180SB856

Item 1: Updating the Research Investment Plan

In preparation for Round 1 of the Climate Change Research Program, SGC staff conducted considerable outreach to state agencies, researchers and other stakeholders. This outreach informed the development of the Research Investment Plan that guided investment in Round 1. The Research Investment Plan identified goals for SGC's research investments and identified five priority investment areas. Given the extensive work that went into the development of the Plan, SGC staff recommends using the Plan to inform investments future investment.

The updated Plan retains the structure of the original plan the original seven sections and subsections are unchanged and the goals and priority research areas included in the original plan. The updated Plan includes the following changes:

- 1) Updates information to reflect newly published information and initiatives: Identifies how to access information from California's Fourth Climate Change Assessment and the AB 2800 Climate-Safe Infrastructure Report.
- 2) Removal of specific level of detail suited for a specific solicitation: Specificity about award criteria, application instructions and administrative requirements was deleted, reducing the plan from 14 to 8 pages. These details will be included in solicitations, which may vary depending on funding priorities.
- 3) Addition of an update provision: To create continuity across the program, the Research Investment Plan will remain active for three years, at which time staff will conduct outreach with state agencies, the research communities, and other stakeholders to update the plan to reflect current research priorities and program goals.

Item 2: Round 2 of the Climate Change Research Program – The California Climate Change Technology and Solutions Initiative

The 2018-19 Budget allocated \$18 million to SGC for the second round of the Research Program. Of that amount, approximately \$17.1 million will be available for award through a competitive process. Staff recommend that these funds be invested to the Governor's Climate Change Technology and Solutions, which prioritizes investments that (1) advances the development and deployment of transformative clean technologies to reduce GHG emissions; (2) integrates elements of equity into climate policies; (3) supports the development of advanced climate data partnerships and initiatives; (4) and prepares the State for a changing climate.

To this end, staff identified the following goals for investments made through Round 2:

- 1) Investments should demonstrate potential to significantly reduce GHG emissions and should show potential to be easily replicable and scalable.
- 2) Awardees' projects or portfolio of projects should provide a holistic approach towards addressing one or more of the identified research areas.
- 3) Institutions should build strong and meaningful partnerships with the research and academic communities, private sector, and community-based organizations.

- 4) Institutions should ensure that innovative technologies have direct and indirect benefits to California's most disadvantaged communities.

Proposed Award Process

In order to maximize the impact of the investments in Round 2, staff recommends making three to four making awards between \$3 and \$5 million to promising collaborative efforts working in one of the priority investment areas.

Competitive applicants will be those who can demonstrate how they meet the following desired qualifications:

- 1) A track record of demonstrated success of research and development going back at least five years.
- 2) The capacity to manage and administer multiple projects of varied stage, size, and scale.
- 3) The ability to set ambitious but achievable targets for success and define metrics for tracking progress.
- 4) The ability to secure leverage funding. Applicants that can secure match-funding and leverage other sources of support (in-kind support is included) will be more competitive than those who cannot.
- 5) The demonstrated ability to work with diverse partners, including communities and other stakeholders, to ensure project success. Preference will be given to established and demonstrated partnerships.

The SGC will require applicants to submit the following documentation as part of solicitation:

- 1) A proposal narrative that outlines:
 - a. A description of the proposed project or portfolio of projects,
 - b. The project's or portfolio of projects' potential for GHG emission reduction,
 - c. Project management structure, including partnerships, and roles and responsibilities,
 - d. Metrics to track progress, and
 - e. A vision for how projects can be scaled up for broader application and, eventual, widespread commercialization or adoption.
- 2) A scalable budget that outlines how initial funds will be invested, as well as the potential reinvest available proceeds of deployment into projects that demonstrate success.
- 3) A summary of the applicant's history and track record of success.
- 4) A summary of each project in the portfolio.
- 5) A resume/CV for each project participant.
- 6) Any supplemental information, including letters of support, documentation of leverage funding, etc.

Eligible Applicants for Round 2

The statutory language for eligible institutions remains the same as Round 1. SB 856 states that that the Program will be open to eligible institutions, including the University of California, California State University, federally-funded national laboratories, and private, non-profit colleges and universities. In order to broaden the reach and potential impact of Round 2 investments, staff recommends that eligible lead applicants for Round 2 also include both for-profit and non-profit research organizations. In order to increase competitiveness, staff recommends limiting lead applicants to two proposals per institution.

Round 2 Review Process

The Round 2 review process follow an approach similar to Round 1. SGC will convene an external advisory committee whose membership includes subject matter experts from academia, government, and the private sector. This Advisory Committee will conduct the initial review. Scores from the Advisory Committee will then be provided to an interagency review committee. The Interagency Review Committee will determine final award recommendations in the context of climate change goals, ongoing and future research investments, and other considerations. These recommendations will be presented to the Council for review at the December Council meeting.

Proposed Round 2 Research Focus Areas

California currently invests a significant amount of funding into research and development, so SGC staff wanted to ensure that the Climate Change Technology and Solutions Initiative was complementary to those efforts and did not duplicate ongoing initiatives. Based on the direction in the Governor's proposed budget and subsequent discussion with the Governor's Office, SGC staff began an informal outreach process to stakeholders. This included over 35 focused meetings with state agencies, researchers, start-ups, community-based organizations, and other non-governmental organizations. The goal of the informal outreach process was to identify ways to maximize the impact of these funds by identifying current research gaps, areas of opportunity, and near-term needs to advance promising climate solutions.

As a result of this outreach, SGC staff identified existing opportunities to maximize the impact of this Initiative. SGC staff proposes issuing three to four grants to support institutions leading on transformative technology and project development in the following areas:

1) Carbon Dioxide Removal

Many peer-reviewed studies, including some prepared for the Fourth California Climate Change Assessment, demonstrate the need for rapid reduction of greenhouse gas accumulation in the atmosphere in order to limit the most serious effects of climate change on the State's communities. Commonly referred to as carbon dioxide removal (CDR), these technologies permanently remove carbon dioxide through various processes, such as direct air capture and sequestration through natural systems. CDR is currently underinvested and poses as a unique opportunity for the SGC to push forward innovation in the removal of carbon from air. Because of the breadth of the CDR field, the SGC is particularly interested in developing ways to induce carbon sequestering through natural systems, as this objective best aligns with the SGC's mission of sustainable, vibrant, and resilient communities.

2) Methane Reduction

Methane has a global warming potential (GWP) of 34, meaning it is 34 times more potent as a greenhouse gas than carbon dioxide. As a result, significant reductions in Methane must occur for California to achieve its 2030 and 2050 climate goals. At the current time, investment in reduction of these emissions is much lower than carbon dioxide emission reductions in the energy or transportation sectors. SGC staff proposes investing in technologies and processes to reduce methane, including in agricultural and industrial processes.

3) Heating, Cooling, and Thermal Storage Systems

Heating and cooling load places stress on the electrical grid and, in the case of cooling, results in use of polluting refrigerants such as Hydrofluorocarbons (HFCs). HFCs have high GWPs and are significantly more potent GHGs than carbon dioxide. Outreach identified significant opportunities to invest in cleaner and more efficient building heating and cooling. Heating and cooling technologies are at the nexus of the SGC's mission of sustainable and resilient communities.

Next steps

With direction from the Council, SGC staff will develop and release a Round Two grant solicitation and provide proposal assistance to potential applicants. Following the application process, SGC will convene an external advisory committee to conduct merit reviews, work with an interagency committee to complete a programmatic review processes, and make award recommendations to the Council at the December 20, 2018 meeting.

Proposed Timeline

Task	Date
SGC Council Meeting: Adopt Updated Research Investment Plan	September 25
SGC Council Meeting: Direct staff to develop RFP	September 25
Work with steering committee to refine and finalize research areas for	Late September to early October
Round 2 Notice of Request for Proposals Released	Early October
Webinar—Proposal Submissions	Mid-October
Application Submission Deadline	Early November
Proposal Review Period	November
External Advisory Committee Meeting	Late November
Assignment to Interagency Committee for Final Review	Late November
Interagency Committee Award Recommendation Meeting	Early December
List of Award Recommendations Posted	December 10
SGC Council Meeting—Awards Approved by the Council	December 20